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ABSTRACT

This field trip program, three 45-minute hands-on workshops and a 30-45-minute interpretive tour, provides students with the opportunity to explore the many ways that the Industrial Revolution significantly changed modes of U.S. work, lifestyle, and land use. The workshops complement one another by exploring different aspects of these changes. Students tour the Boott Cotton Mills Museum operating weave room, the restored "mill girl" boardinghouse in the "Working People Exhibit," and play a role in the "human loom." The activity guide describes three different activities to be undertaken by visiting students. It also recommends a variety of other activities to help the teacher prepare for the class visit to the Tsongas Industrial History Center in Lowell, Massachusetts. The guide presents the theme, lists program objectives, furnishes connections to Massachusetts Curriculum Frameworks, and enumerates pre- and post-visit activities. A glossary of terms is included. (BT)

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Change in the Making

Activity Guide

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SO 031 207

Tsongas Industrial History Center

The Tsongas Industrial History Center is a joint educational enterprise sponsored by the University of Massachusetts Lowell and Lowell National Historical Park. Established in 1987, its goal is to encourage the teaching of industrial history in elementary and secondary schools.

Change in the Making includes three 45-minute hands-on workshops and a 30-45-minute interpretive tour. The workshops and tour provide students with the opportunity to explore the many ways that the Industrial Revolution significantly changed the way Americans work, live and use the land. The workshops complement one another by exploring different aspects of these changes as people and work moved from farm to factory. Students tour the Boott Cotton Mills Museum operating weave room, the restored "mill girl" boardinghouse in the Working People Exhibit, and play a role in the "human loom."

Invention Activity

Students compare doing work by hand with doing work using a simple machine. They will try to remove seeds from unginned cotton first by hand, then by inventing a way to do it with a selection of familiar materials, and finally by operating a hand-cranked cotton gin. Students will also learn to weave on hand-operated table looms.

Farmhouse to Boardinghouse Activity

Students become young farm and factory workers as they try on 19th century clothing and discuss where factory workers came from, reasons for leaving home, housing, work, how people travelled to the city and more. Mill songs and a visit to the Boardinghouse help to set the scene.

Country to City Map Activity

Around a large floor map of the Merrimack River area, students help to tell a multi-sensory story about how land and the river were used and changed over time. They explore how the growth of population and the Industrial Revolution changed the fields, forests, and farmland of the Merrimack River Valley with the addition of bustling industrial cities.

Tour

One highlight of the tour is a visit to the restored weave room in the Boott Cotton Mills Museum. Standing among the roaring power looms, students compare and contrast weaving on hand looms with weaving on power looms. They become part of a "human" loom to better understand the weaving process. Students are challenged to consider the changes and conditions workers experienced on the farm and in the factory.

Activity Guide

Inside this booklet you will find a variety of recommended activities to help you prepare your class for their visit to the Tsongas Industrial History Center and Change in the Making. Each of the pre-visit activities relate directly to portions of the program your students will experience when they arrive. They will also enjoy hearing or reading The Bobbin Girl before their visit. The Bobbin Girl by Emily McCully is a wonderful story about a young girl who works in one of the Lowell Mills. We recommend choosing post-visit activities to follow-up your visit.

Theme

The Industrial Revolution was a defining era in American history. All that we consider "modern" was significantly shaped by this period, whether it be in technology , politics, art, culture, or the nature of work itself.

The Industrial Revolution significantly changed the way Americans worked, lived and used the land.

Program Objectives

After visiting the Park and the Tsongas Center and completing the activities in this guide, students will be able to:

- *identify ways that inventions and technology have changed the way people do their work.*
- *list reasons why people move from one place to another , with emphasis on economic opportunities and pressures.*
- *describe how changes in land use affect the landscape and the environment.*
- *explain how the Industrial Revolution transformed the way people lived and how goods were produced.*

Connections to Massachusetts Curriculum Frameworks

History and Social Science Curriculum Frameworks:

History Strand, Learning Standard 1: Students put events in chronological order and recognize the complexity of historical cause and effect.
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English Language Arts:

Language Strand, Learning Standards 1 and 2: Students will use agreed-upon rules for informal and formal discussions in small and large discussions...and will contribute their own information or ideas.
Literature Strand, Learning Standard 12: Students will identify...fiction and provide evidence from the text to support their understanding.
Literature Strand, Learning Standard 14: Students will identify the them of poetry .
Literature Strand, Learning Standard 15: Students will identify how an author's choice of words appeals to the senses.

Pre-Visit Activities

1. Everyday Inventions

Many of the things we take for granted in our environment have been around in some form or another for years and years; other things are relatively new . This activity prompts students to think about the origins and limitations of common, everyday things.

Identifying and Researching an Ordinary Item

Have students identify something they use every day at home or at school. Their task is to find out who invented it and/or when it was invented.

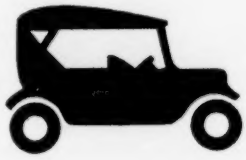
Presenting Their Findings

Once students have researched their item, have them present their findings in one of the following ways:

- *create a diorama*
- *draw a picture*
- *write a description*
- *develop and present a skit for the class*

Things to Think About and Ask:

- *Is there a difference between when the item was first invented and when people started using it on a regular basis?-Why?*
- *What companies make and sell this invention? W ere they the original inventors and/or manufacturers?*
- *What was the public's response to the initial invention?*
- *Can you improve on this invention?-How?*
- *How would you go about selling your improved invention?*



2. Making a Water Wheel

Materials:

2	*plastic plates*
6	*8-ounce plastic cups*
2	*3-ounce plastic cups*
1	*dowel (approx. 12 inches long)*
	string or ribbon
	masking tape

Materials for wheel base:

about 6 milk or juice cartons (1/2 gallon, rectangular, waxed kind)

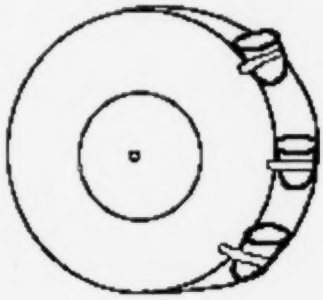
Directions:

1) Punch holes in center of plates and center of bottom of 3-oz. cups.

2) Place plates bottom to bottom, attaching them with rolled-up masking tape and also taping them around the inside edge.

3) Space 8-oz. cups around edge of the plate. Tape so that all cups catch water in the same direction.

4) Put dowel through center of plates. Tape 3-oz. cups bottom to bottom. Put dowel through center of cups. The small cups act as a take-up reel. Tape a long piece of string or ribbon to the take-up reel.



To use the wheel:

5) Make 2 stacks of 3 milk or juice cartons laid on their sides. (Use more or fewer cartons depending on the depth of your sink.) Tape cartons together, preferably with duct tape.

6) Punch a hole in top carton of each stack and insert dowel ends into stacks.

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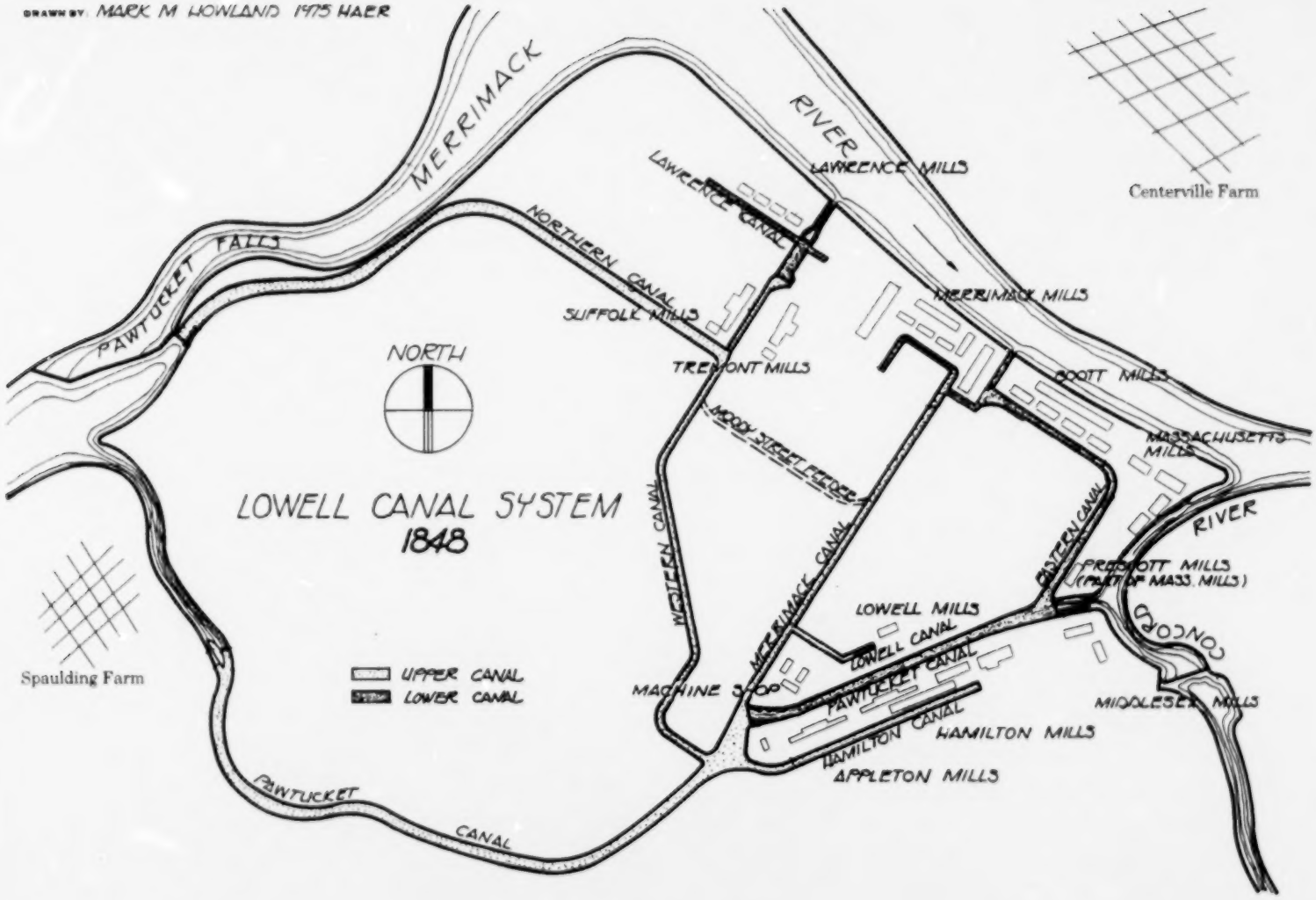
7) Place entire base/wheel set-up into sink and run water onto cups on wheel. As wheel turns, dowel and take-up reel should turn, too. (Tape plates or take-up cups to dowel if necessary.)

3. Emily Nutter's Work Day on the Farm and in the Mill

Time:	*Emily on the Farm*	*Emily in the Mill*	*Your Day*
4:00 am		*Get up and dressed.*	
5:00 am	*Get up and dressed*	*Mill opens; work begins.*	
	Milk the cows in the barn.	*Work at spinning frame.*	
6:00 am			
7:00 am	*Eat breakfast.*	*Home for breakfast.*	
	Feed the chickens.		
8:00 am		*Back to the mill.*	
		Machines begin.	
		Work at spinning frame.	
9:00 am	*Help mother make cheese from milk.*		
10:00 am	*Make bread. While dough rises, spin yarn. Keep an eye on baby brother.*		
11:00 am			
12:00 pm	*Help mother prepare lunch.*	*Home for lunch.*	
	Eat lunch and feed baby.		
1:00 pm	*Work in the garden.*	*Back to the mill*	
	Gather vegetables	*Machines begin.*	
		Work at spinning frame.	
2:00 pm			
3:00 pm	*Neighbor visits to trade wool for eggs. Spin while neighbor visits with mother.*		
4:00 pm			
5:00 pm	*Make stew from garden vegetables.*		
6:00 pm	*Milk cows again. Eat dinner.*		
7:00 pm	*Wash dishes.*	*Work ends. Mill closes.*	
		Go home.	
7:30 pm	*Sew a shirt while father reads the Bible to the family.*	*Eat supper.*	
8:00 pm		*Free time.*	
9:00 pm	*Go to bed.*	*Lights out. Go to bed.*	

For Discussion: Compare Emily's work day on the farm with her work day in the mill. Which work day would you prefer, and why? Now, compare your work day with Emily's. How has the Industrial Revolution affected the kinds of work you do? How has it affected the amount of free



Please color the following: rivers - blue, canals - light blue, mills - red, farms - green, waterfall - yellow

Post-Visit Activities

1. Poetry in the Classroom

Materials needed:

10-20 index cards per group (or paper cut to 3x5 size)
paper on which to record the final poem
markers or pencils
photos, artifacts or other stimuli for ideas

Directions:

1) This activity can be done as a large group (i.e. a whole class) concentrating on one theme, or you can break the class down into smaller groups and assign them different themes, photos, or scenes to describe.

For example: Native American Life, Farm Life, Factory Life
Leaving Home, Beginning a New Life in the City

2) Choose a recorder for each group. This person will write the words on the cards as they are suggested by members of the group. Encourage each group member to contribute a minimum of 2 or 3 words.

3) Ask students to give a variety of words representing the themes or scenes they are describing. They should vary the parts of speech (nouns, verbs, adjectives, etc.) You may want to encourage them to keep the five senses in mind.

4) After students have about 10 - 20 words, they can lay them out on the floor or table and begin to arrange them to make a poem. W ords can be arranged into a DIAMANTE poem as follows:

First line:	*one noun*	*Farm*
Second line:	*two adjectives*	*Sunny, Quiet*
Third line:	*three verbs*	*Spinning, planting, cooking*
Fourth line:	*four nouns*	*Family, animals, fields, cows*
Fifth line:	*three verbs*	*Playing, singing, plowing*
Sixth line:	*two adjectives*	*Happy, busy*
Seventh line:	*one noun*	*Home*

Variations:

1) If students work with a variety of themes or pictures, share their poems and have others try to match each poem with its theme or picture.

2) Have each group react to the same theme and then compare their poems.

3) Give one group's cards to a new group to arrange a poem. Compare that group's poem with the original.

4) Collect all the cards and have the whole group create a poem that captures the entire

2. Quill Pen Writing Project

Materials:

Newspapers to cover tables
Non-permanent ink
Paper cups with water
Paper
Large craft-store feather -with end sharpened into a point and slit in center (Quill pen kit can be purchased in the Boott Mill Museum Shop)
Paper towels

Discussion: Have students begin to think about what it would be like to leave home for the first time, and how they would feel not knowing when they would see their families again. Have them expand on this thought by thinking about how the early mill workers felt not only leaving home, but changing their entire way of life in the process. This can lead to a discussion of communication past and present. Since the early mill workers only had the mail, they wrote lots of letters. They did not have ball point pens or markers. They had to write with quill pens.

Activity:

1) Cover tables with newspaper, put bottles of ink and water around table

2) Students should stand around table with enough room to write comfortably

3) Explain how pen is used: hold it like a pencil on top, dip into the ink about half an inch (enough to get some ink up into the tip). To write, press GENTLY with the tip on the paper. The slit in the tip will open up, allowing ink to flow down and onto the paper. Experiment to find the right amount of pressure. ALWAYS draw the tip downward and towards you; never push upward on the tip or it may break or splatter the ink.

4) After the students practice, have them write a letter telling the folks at home how much their life has changed since coming Lowell. They can think about both good and bad experiences in the mills, boardinghouses or the city itself. Encourage them to use traditional greetings and closing for example: "Most honored parents," or "Dear loving brother," and "your obedient servant," or "your loving daughter".

Other ideas for writing projects:

Create diary entries regarding life in Lowell.
Write invitations to a boardinghouse dinner.
Write a thank you letter to the museum teacher at the Tsongas Center.

3. Other Post-Visit Activity Suggestions:-

A. Students can make a diorama depicting life along the Merrimack. Students can work in groups or individually to make a scene that shows:

Native American Life along the Merrimack
Farm Life in East Chelmsford
Factory Life in Lowell

Or ask students to draw pictures to depict these same scenes. A class mural can be made using their drawings. Discuss how the Industrial Revolution changed the way Americans worked, lived, and used the land.

B. History of Lowell Play:-Students may be instructed to dramatize a particular era in Lowell history. The class could be broken into several groups, each group responsible for a different part of Lowell's history. Some natural subdivision would be the time when Lowell was inhabited by Native Americans, early agrarian life, and industrialization and growth of the city. The play could be simple or complex as time permits.

C. Students can draw, or cut out from magazines, pictures of inventions that have changed our way of life. Ask them to draw pictures of how these same things were done in the past. Good discussions come from exploring their views about which inventions are most important.

D. Students can weave with paper.
Select two pieces of 8" x 10" colored construction paper.
Fold one sheet in half. Beginning at the fold, cut lines about one inch apart, leaving a one inch margin uncut at the edge of the page.
Cut the other sheet into one inch strips.
Weave the individual strips one at a time into the other page- over , under, over, under - repeat until the pattern is completed.

Or weave plastic "jute" into colored embroidery plastic, or create a frame loom and use yarn.

Terms

boardinghouse - *A large dormitory-style building built and owned by the mill owners. Factory workers lived there.*

bobbin - *Yarn is wrapped around this and placed inside a shuttle that carries the weft thread through the shed.*

cotton gin - *A machine used to separate the seeds from cotton.*

factory - *A building or groups of buildings in which goods are made.*

farm - *An area of land, including the buildings, on which crops or animals are raised.*

Industrial Revolution - *The period of time when people started to make products using machines, instead of making things by hand.*

invention - *A new device or method developed through creativity , study, and experimentation.*

loom - *A machine that weaves threads together to make cloth.*

mill girls - *Young women who came to work in the mills. Most came from farms in New England.*

river - *A natural flow of water which empties into another river , a lake or an ocean.*

shuttle - *The tool that carries the weft thread in a loom.*

technology - *The ideas and tools which enable people to do and make things that they want*

warp - *The vertical thread attached to the loom.*

waterwheel - *An early device used to harness waterpower .*

weft - *The horizontal thread, or the yarn running perpendicular to the warp.*

weaving - *One of the last steps in making cloth. Threads cross each other in an over and under pattern. Weaving is done on a loom.*

Selected Resources

Selections for Students:

Bracken, Jeanne. "Hannah at the Mill," Cricket, March (Vol. 22, #7), pp.49, 1995.

Cherry, Lynne. A River Ran Wild. NY: Harcourt Brace and Co.,1982.

Deneberg, Barry. So Far From Home: The Diary of Mary Driscoll, an Irish Mill Girl. NY: Scholastic Inc., 1997.

dePaola, Tomie. Charlie Needs a Cloak. NY: Scholastic Inc.,1973.

Geraldine. The Goat in the Rug. NY: Aladdin Paperbacks, 1976.

Gillon, Jr., Edmund V. Cut &-Assmble a Nineteenth Century Mill Town. NY:-Dover Publications, Inc. 1993.

Hall, Donald. The Ox Cart Man. NY: Puffin Books, 1979.

Macaulay, David. Mill. Boston: Houghton Mifflin Co.,1983.

McCully, Emily. The Bobbin Girl. NY: Dial Books for Young Readers, 1996.

McPhail, David. Farm Boy's Year. NY: Atheneum, 1992.

Pyne, Patricia Powell. The Magic Chopsticks. Lowell, MA: Pelican Publishing Co., 1995.

Riquier, Aline. The Cotton in Your T-Shirt. NY: Young Discovery Library, 1985.

Ross, Pat. Hannah's Fancy Notions. NY: Puffin Books, 1992.

West, David. 53 1/2 Things that Changed the World and Some that Didn't! Brookfield, CT: The Millbrook Press, 1992.

Ziefert, Harriet. A New Coat for Anna. NY: Alfred A. Knopf,1986.

Selections for Teachers:

Bender, Lionel. Invention. NY: Alfred A. Knopf, 1991.

Cronon, William. Changes in the Land: Indians, Colonists and the Ecology of New England. NY: Hill and Wang, 1983.

Dublin, Thomas. Farm to Factory: Women's Letters 1830-1860. NY: Columbia University Press, 1981.

Dublin, Thomas. The Story of an Industrial City. Washington, D.C.: National Park Service, 1993.

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Kalman, Bobbie. 19th Century Clothing. Crabtree Publishing Co., 1995.

Pendergast, John. The Bend in the River. Tyngsborough, MA: Merrimac River Press, 1991.

Paterson, Katherine. Lyddie. NY: Lodestar, 1990.

Mrozowski, Stephen A., Grace H Ziesing, and Mary C. Beaudry. Living on the Boott. Amherst, MA: University of MA Press, 1996.

Weisman, Jo Anne B. ed. The Lowell Mill Girls: Life in the Factory. Lowell, MA: Discovery Enterprises, Ltd., 1991.

Wilkinson, P. and M. Pollard. Industrial Revolution. Chelsea House Publishers, 1995.

CD ROMS and Software:

Ideas that Changed the World. ICE. (Macintosh / Windows)

Invention Studio. Discovery Communication, 1996. (Macintosh / Windows)

The Industrial Revolution in America. Queue. (Macintosh / Windows)

The Way Things Work. DK Multimedia, 1996. (Macintosh / Windows)

TimeLiner. Tom Synder Productions.

Change in the Making

Connections toMassachusetts Curriculum Standards:

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